



Sequence Listing

<110> Walter Reed Army Institute of Research
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Kumar, Sanjai
Rogers, William
Barbosa, Arnaldo

<120> Expression, Purification, and Uses of a *Plasmodium falciparum* Liver Stage Antigen 1 Polypeptide

<130> 003/285/SAP

<140> 10/706,435

<141> 2003-11-12

<150> 60/425,719

<151> 2002-11-12

<160> 28

<170> Microsoft Word XP

<210> 1

<211> 17

<212> PRT

<213> *P. falciparum* LSA-1

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<223> LSA-1 major 17 amino acid repeat

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Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg
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Leu Ala Lys Glu Lys Leu Gln
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<210> 2

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<213> *P. falciparum* LSA-1

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<223> LSA-1 minor 17 amino acid repeat

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Leu Ala Lys Glu Lys Leu Gln
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tcctacgaga	agactaaaaa	caacgaaaac	aacaaattct	160
ttgacaagga	caaagagctg	acgatgagca	acgttaaaaa	200
cgtatcccag	accaacttta	aatccctcct	gcgcaacctc	240
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acaaggaagg	caaactgatt	gaacatatca	tcaacgacga	320
cgatgacaaa	aaaaaataca	ttaaaggcca	ggatgaaaat	360
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gaaaacgaac	gcggtactta	catcccacac	cagagcagcc	640
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accaacgtgg	aaggccgcgc	cgacatccac	aaaggccacc	760
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cgacaaatcc	ctctacgacg	agcacattaa	aaaatacaaa	1200
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			15						20	
Asn	Ser	Arg	Asn	Arg	Ile	Asn	Glu	Glu	Lys	
			25						30	
His	Glu	Lys	Lys	His	Val	Leu	Ser	His	Asn	
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Ser	Tyr	Glu	Lys	Thr	Lys	Asn	Asn	Glu	Asn	
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Asn	Lys	Phe	Phe	Asp	Lys	Asp	Lys	Glu	Leu	
			55						60	
Thr	Met	Ser	Asn	Val	Lys	Asn	Val	Ser	Gln	
			65						70	
Thr	Asn	Phe	Lys	Ser	Leu	Leu	Arg	Asn	Leu	
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Gly	Val	Ser	Glu	Asn	Ile	Phe	Leu	Lys	Glu	
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Asn	Lys	Leu	Asn	Lys	Glu	Gly	Lys	Leu	Ile	
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Glu	His	Ile	Ile	Asn	Asp	Asp	Asp	Asp	Lys	
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Lys	Lys	Tyr	Ile	Lys	Gly	Gln	Asp	Glu	Asn	
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Arg	Gln	Glu	Asp	Leu	Glu	Glu	Lys	Ala	Ala	
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Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	Glu	Arg	
			135						140	
Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Arg	Leu	
			145						150	
Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Arg	
			155						160	
Asp	Leu	Glu	Gln	Arg	Lys	Ala	Asp	Thr	Lys	
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Lys	Asn	Leu	Glu	Arg	Lys	Lys	Glu	His	Gly	
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Asp	Val	Leu	Ala	Glu	Asp	Leu	Tyr	Gly	Arg	
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Leu	Glu	Ile	Pro	Ala	Ile	Glu	Leu	Pro	Ser	
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Glu	Asn	Glu	Arg	Gly	Tyr	Tyr	Ile	Pro	His	
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Gln	Ser	Ser	Leu	Pro	Gln	Asp	Asn	Arg	Gly	
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Asn	Ser	Arg	Asp	Ser	Lys	Glu	Ile	Ser	Ile	
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Ile	Glu	Lys	Thr	Asn	Arg	Glu	Ser	Ile	Thr	
			235						240	
Thr	Asn	Val	Glu	Gly	Arg	Arg	Asp	Ile	His	
			245						250	
Lys	Gly	His	Leu	Glu	Glu	Lys	Lys	Asp	Gly	
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Ser	Ala	Asp	Ile	Gln	Asn	His	Thr	Leu	Glu	
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Thr	Val	Asn	Ile	Ser	Asp	Val	Asn	Asp	Phe	
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Gln	Ile	Ser	Lys	Tyr	Glu	Asp	Glu	Ile	Ser	
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Ala	Glu	Tyr	Asp	Asp	Ser	Leu	Ile	Asp	Glu	
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Glu	Glu	Asp	Asp	Glu	Asp	Leu	Asp	Glu	Phe	
				315						320
Lys	Pro	Ile	Val	Gln	Tyr	Asp	Asn	Phe	Gln	
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Asp	Glu	Glu	Asn	Ile	Gly	Ile	Tyr	Lys	Glu	
				335						340
Leu	Glu	Asp	Leu	Ile	Glu	Lys	Asn	Glu	Asn	
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Leu	Asp	Asp	Leu	Asp	Glu	Gly	Ile	Glu	Lys	
				355						360
Ser	Ser	Glu	Glu	Leu	Ser	Glu	Glu	Lys	Ile	
				365						370
Lys	Lys	Gly	Lys	Lys	Tyr	Glu	Lys	Thr	Lys	
				375						380
Asp	Asn	Asn	Phe	Lys	Pro	Asn	Asp	Lys	Ser	
				385						390
Leu	Tyr	Asp	Glu	His	Ile	Lys	Lys	Tyr	Lys	
				395						400
Asn	Asp	Lys	Gln	Val	Asn	Lys	Glu	Lys	Glu	
				405						410
Lys	Phe	Ile	Lys	Ser	Leu	Phe	His	Ile	Phe	
				415						420
Asp	Gly	Asp	Asn	Glu	Ile	Leu	Gln	Ile	Val	
				425						430
Asp	Glu	Arg	Leu	Ser	Glu	Asp	Ile	Thr	Lys	
				435						440
Tyr	Phe	Met	Lys	Leu	Gly	Gly	Ser	Gly	Ser	
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Pro	His	His	His	His	His	His				
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<223> LSA-1 Consensus sequence of 17 amino acid repeats where Xaa at position 1 is either Glu or Gly; Xaa at position 4 is Ser or Arg; Xaa at position 6 is Asp or Ser; Xaa at position 9 is Glu or Asp; Xaa at position 11 is Leu or Arg; Xaa at position 13 is Lys or Asn and Xaa at position 15 is Lys or Thr or Arg.

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 5 10

Xaa Ala Xaa Glu Xaa Leu Gln
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<210> 6

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 T1 epitope

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 5 10

Gln Thr Asn Phe Lys Ser Leu Leu Arg Asn
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Leu Gly Val Ser

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<223> *P. falciparum* LSA-1 LSA-Rep epitope

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Leu Ala Lys Glu Lys Leu Gln
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<210> 8

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Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu
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Gln Gln Arg Asp Leu Glu Gln
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Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu
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 25 30
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 Lys Leu

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 Leu Gly Val Ser

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 LSA1.1 epitope

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 Doolan 1671 epitope

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<213> *P. falciparum* LSA-1

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<223> Amino acid sequence of LSA-NRC(H) repeat sequence between N & C terminals

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Asp Leu Glu Gln

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<223> DNA sequence of the gene LSA-NRC(H)

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tcctacgaga agactaaaaa caacgaaaac aacaaattct   160
ttgacaagga caaagagctg acgatgagca acgttaaaaa   200
cgtatcccag accaacttta aatccctcct gcgcaacctc   240
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gacctggaac agcgcaaggc tgacacgaaa aaaaacctgg 520
aacgcaaaaa ggaacacggc gacgttctgg ctgaggacct 560
gtacggccgc ctggaaatcc cagctatcga actcccatcc 600
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cgacaaatcc ctctacgacg agcacattaa aaaatacaaa 1200
aacgacaagc aagtgaacaa ggaaaaggaa aaatttatca 1240
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<210> 26
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Ile Lys Ser Asn Leu Arg Ser Gly Ser Ser
      15                                     20
Asn Ser Arg Asn Arg Ile Asn Glu Glu Lys
      25                                     30
His Glu Lys Lys His Val Leu Ser His Asn
      35                                     40
Ser Tyr Glu Lys Thr Lys Asn Asn Glu Asn
      45                                     50
Asn Lys Phe Phe Asp Lys Asp Lys Glu Leu
      55                                     60
Thr Met Ser Asn Val Lys Asn Val Ser Gln
      65                                     70
Thr Asn Phe Lys Ser Leu Leu Arg Asn Leu
      75                                     80
Gly Val Ser Glu Asn Ile Phe Leu Lys Glu
      85                                     90

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Asn	Lys	Leu	Asn	Lys	Glu	Gly	Lys	Leu	Ile	95	100
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Lys	Lys	Tyr	Ile	Lys	Gly	Gln	Asp	Glu	Asn	115	120
Arg	Gln	Glu	Asp	Leu	Glu	Glu	Lys	Ala	Ala	125	130
Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	Glu	Arg	135	140
Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Arg	Leu	145	150
Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Arg	155	160
Asp	Leu	Glu	Gln	Arg	Lys	Ala	Asp	Thr	Lys	165	170
Lys	Asn	Leu	Glu	Arg	Lys	Lys	Glu	His	Gly	175	180
Asp	Val	Leu	Ala	Glu	Asp	Leu	Tyr	Gly	Arg	185	190
Leu	Glu	Ile	Pro	Ala	Ile	Glu	Leu	Pro	Ser	195	200
Glu	Asn	Glu	Arg	Gly	Tyr	Tyr	Ile	Pro	His	205	210
Gln	Ser	Ser	Leu	Pro	Gln	Asp	Asn	Arg	Gly	215	220
Asn	Ser	Arg	Asp	Ser	Lys	Glu	Ile	Ser	Ile	225	230
Ile	Glu	Lys	Thr	Asn	Arg	Glu	Ser	Ile	Thr	235	240
Thr	Asn	Val	Glu	Gly	Arg	Arg	Asp	Ile	His	245	250
Lys	Gly	His	Leu	Glu	Glu	Lys	Lys	Asp	Gly	255	260
Ser	Ile	Lys	Pro	Glu	Gln	Lys	Glu	Asp	Lys	265	270
Ser	Ala	Asp	Ile	Gln	Asn	His	Thr	Leu	Glu	275	280
Thr	Val	Asn	Ile	Ser	Asp	Val	Asn	Asp	Phe	285	290
Gln	Ile	Ser	Lys	Tyr	Glu	Asp	Glu	Ile	Ser	295	300
Ala	Glu	Tyr	Asp	Asp	Ser	Leu	Ile	Asp	Glu	305	310
Glu	Glu	Asp	Asp	Glu	Asp	Leu	Asp	Glu	Phe	315	320
Lys	Pro	Ile	Val	Gln	Tyr	Asp	Asn	Phe	Gln	325	330
Asp	Glu	Glu	Asn	Ile	Gly	Ile	Tyr	Lys	Glu	335	340
Leu	Glu	Asp	Leu	Ile	Glu	Lys	Asn	Glu	Asn	345	350
Leu	Asp	Asp	Leu	Asp	Glu	Gly	Ile	Glu	Lys	355	360

Ser	Ser	Glu	Glu	Leu	Ser	Glu	Glu	Lys	Ile
				365					370
Lys	Lys	Gly	Lys	Lys	Tyr	Glu	Lys	Thr	Lys
				375					380
Asp	Asn	Asn	Phe	Lys	Pro	Asn	Asp	Lys	Ser
				385					390
Leu	Tyr	Asp	Glu	His	Ile	Lys	Lys	Tyr	Lys
				395					400
Asn	Asp	Lys	Gln	Val	Asn	Lys	Glu	Lys	Glu
				405					410
Lys	Phe	Ile	Lys	Ser	Leu	Phe	His	Ile	Phe
				415					420
Asp	Gly	Asp	Asn	Glu	Ile	Leu	Gln	Ile	Val
				425					430
Asp	Glu	Leu	Ser	Glu	Asp	Ile	Thr	Lys	Tyr
				435					440
Phe	Met	Lys	Leu	Gly	Gly	Ser	Gly	Ser	Pro
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His	His	His	His	His	His				
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